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ORIGINAL ARTICLES.

HOMATROPIA IN REFRACTIVE CASES.

BY JULIAN J. CHISOLM, M.D., BALTIMORE, MD.

I have been so often asked by letter what mydriatic I use in refraction work that I am induced to send you a few lines indicating my daily practice. Since 1883 I have been using homatropia with such steadily increasing confidence that now I rarely use any thing else; use it in aqueous solutions, grs. vi, to 3j. I instill a few drops into the conjunctival sac, the lids being held apart for a minute so that the drops can not be expelled. This stretching of the lids apart removes the puncta from the eye-ball, and prevents the medicated liquid from escaping into the lachrymal sac. In from thirty to sixty minutes the eyes are ready for testing with pupils well expanded and accommodation for all practical purposes suspended. The aqueous solution is absolutely painless and in this regard has a very decided advantage over the oleates, which may be more economical in use, but cause pain in their application. I find no refractory cases to the influence of homatropia and consequently I have no occasion to use atropia, hyosciamia or duboisia. I used all of these salts

formerly for correcting errors of refraction, but now restrict them to iritic troubles. I am quite sure that I do not use atropia once to the hundred applications of homatropia.

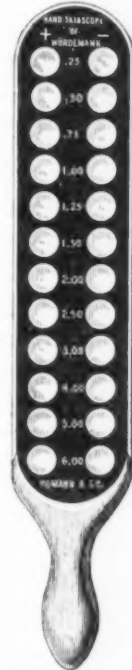
The marked advantages of homatropia over all other mydriatics is the evanescent nature of the phenomena induced. As a rule, with very few exceptions, the effects are pretty well off by bed time from morning instillation, and before twenty-four hours have expired full eye work can be resumed, so that by taking advantage of Sunday, business men need not lose one hour from their daily work. So very valuable is this single quality of transient physiological action that it alone should drive atropia from daily use in the adjustment of lenses. Judging from the entire satisfaction which homatropia gives me in refractive work, I consider a physician culpable who robs a working man or a sewing woman of a week's daily bread through his preference for the more persistent atropia. Perhaps he does not know, and I am afraid sometimes does not value, how much misery he entails in carrying out his pet projects with atropia, duboisia or hyosciamia. I am very glad to say that in homatropia I have found a much better remedy than atropia. It always serves me faithfully and does not annoy my patients. I find it strong enough in simple aqueous solutions unaided by cocaine. Years ago I tried castor oil as the menstruum, but after a few months gave it up for the aqueous solution which I daily use. When I read of the obstinacy attending the relaxation of the accommodative muscles in the experience of some specialists, and how homatropia is never strong enough to meet their requirements, I am only glad to say that I do not come across such cases every day or even once a month. I take great comfort to myself that I have not annoyed the 99 cases in seeking the one refractory case, that rebelled against the persuasive influence of the milder mydriatic.

A SIMPLE SKIASCOPE.

BY H. V. WURDEMAN, M.D., OF MILWAUKEE, WISCONSIN.

The findings of the "shadow test" are accurate to .25 D., so I have learned to place such reliance upon the method that were I suddenly deprived of it, I would be at loss to do my refractive work properly, especially in low grades of astigmatism. The use of the Skiascope, instead of being merely an additional test, facilitates the examination greatly, and the results obtained by this method of ocular examination may be relied upon more than any other. I would have no hesitation in fitting glasses by Skiascopy alone but of course use it in conjunction with other methods.

The instrument figured has given such satisfaction that I take pleasure in bringing it to the notice of the profession. It consists of an oblong blade of hard rubber in which are inserted twelve plus and twelve minus lenses. The method of using this instrument is similar to that of my disk skiascope (see JOURNAL, May, 1890,¹) with the exception that instead of rotating, the patient raises or lowers the contrivance by the handle at the word of the examiner. At first the subject brings the plus .75 lens before his eye which completely neutralizes the movement of the lighted retinal area if he be emmetropic. If he is known to be myopic or hyperopic from a



HAND SKIASCOPE.

previous test, the skiascopic examination may be begun with the calculated lens. The shadow test will then be both a corroborative and a finer test of the refraction. If the neutralizing lens be convex the refraction of the eye in that meridian is .75 D. weaker, and if concave the same amount stronger. Thus we add .75 D. in myopia and subtract it in hyperopia. (see article by author.¹)

If stronger glasses be needed a pair of lenses from the trial case may be worn by the patient in a trial frame behind the instrument and their strength added to those in the skiascope. Thus any combination may be secured. Both the disk skiascope and the hand instrument are made by the firm of Geo. Tiemann & Co., New York, with the excellence that characterizes all their productions.²

¹"The Use of Skiascopy," AMERICAN JOURNAL OF OPHTHALMOLOGY, May, 1890.

²I understand that Landolt uses a hand "retinoscope" in his Paris clinic, but I have not seen this instrument.

AN ACUTE GLAUCOMATOUS ATTACK IN THE
RIGHT EYE OF A COLORED MAN, ÆT. 24—
LEFT EYE WAS DESTROYED SIX YEARS
PREVIOUS BY A PISTOL BALL. RE-
MOVAL OF LEFT EYE.

BY GEO. S. LLOYD, M.D., TARBORO, N. C.

In the AMERICAN JOURNAL OF OPHTHALMOLOGY of December, 1889, Dr. B. E. Fryer, of Kansas City, Mo., reports a case of "Acute glaucoma in the right eye of a patient, æt. 28, the left eye being destroyed by traumatism," and in conclusion writes:

"The general belief is that glaucoma is not produced sympathetically; but is sympathy never a factor?"

In response to the above question, I wish to report the following case, referred to me by Dr. Zeno H. Brown, of Greenville, N. C. The patient, on awakening one morning, two weeks prior to the visit to me, was greatly alarmed on account of his vision being much decreased in the right eye from what it was on retiring. He discovered that objects looked very dim and misty; that there appeared a fog which, at times, lasted from a few minutes to several hours. Several days elapsed before the eye began to pain him. The pain was very severe and he required opiates to obtain relief. On the fourth day he noticed a red and blue *halo* around a lamp (this symptom being most observed by the patient), and complained of fullness of the eye.

Examination.—Vision right eye, $\frac{20}{cc}$. Left eye nil.

Upon examination I found the pupil of the right eye partially dilated, responding slowly to light. The field of vision was slightly contracted on the nasal side; very little change

in the depth of the anterior chamber. Tension +2. With the ophthalmoscope the cornea appeared slightly "steamy." Aqueous, lens, and vitreous normal. The optic papilla was slightly cupped.

Six years before the left eye had been injured by a pistol ball. This injury resulted in complete destruction of the eyeball. I prescribed eserine dropped into the right eye several times a day, and advised the immediate removal of left eye, to which he did not assent. The patient returned home the same day with instructions that if the right eye did not improve within five days he should return prepared to remain in Tarboro several days, as I would perform an iridectomy on the right eye and also enucleate the left one. I, anyhow, advised his return, should his right eye, even, improve, for the removal of the left eye, as, in my opinion, the left eye was the immediate cause of the disease in the right eye. In a week I received a letter from him, saying that all of the above symptoms had entirely disappeared, under the treatment.

I saw him again on May 7, when on a professional trip to Greenville. I then found vision, right eye, $\frac{20}{LXX}$, and the entire cessation of all the symptoms. The nerve was now normal in appearance. Tension normal.

Dr. H. O. Hyatt, of Kingston, N. C., saw him with me and confirmed my opinion. Having again warned him of the danger due to the presence of the shrunken eye, he consented to its removal; so, on the following day, assisted by Drs. Hyatt and Zeno Brown, I performed this operation.

Since the operation, I have been apprised, there has been no return of the symptoms above recited.

CASE OF CHANCRE OF THE RIGHT UPPER LID.

FROM DR. A. ALT'S CLINIC,

Reported by Dr. W. L. Blickhahn, St. Louis.

P. Mc., male, æt. 40, presented himself at Dr. Alt's clinic at the Beaumont Hospital Medical College, on April 15, 1891, with a swelling on the right upper lid, chiefly its temporal half, and the lid margin. There was a reddish appearance of the conjunctiva corresponding to it, but no ulceration, and apparently no denudation of the epithelial surface.

He gave the following history: He had had a sore on his penis twelve years ago, which healed promptly on using local and constitutional (?) treatment. No sequelæ appeared. On February 5, 1891, he again discovered a sore on his penis. He called on a physician who treated him. Some time after he noticed that his right eye was red, and that a lump had formed in the right upper lid. The eye was treated by means of an "eye water" and "salve." As it did not improve, he was sent to an ophthalmological clinic, and there it was decided that he must have inoculated his eyelid with matter from his penis. He was given "a wash" and an ointment, and some days later presented himself at Dr. Alt's clinic at the Beaumont Hospital Medical College.

In spite of this history the diagnosis of hordeloum was made. The patient was treated in the hospital department on account of the sore on the penis. What was considered to be a "phagedenic chancroid" had nearly destroyed the glans. As

the surgical treatment was very painful, and his eye did not bother him, only that he feared it might do as his penis did, he begged to have the slitting of the "stye" put off.

Looking on it as a simple affair (it was to all intents and purposes an ordinary stye, in the depth of which pus was suspected to be lurking), the patient was given an antiseptic lotion and kept under observation. One week from the first inspection the swelling had increased somewhat, though the inflammation was not very active; there was no general œdema of the lid, nor was there much pain, and Dr. Alt suggested incision as a means of diagnosis, he being skeptical as to the specificity of the tumor, and he made two parallel incisions through the swelling. No pus, but some serous fluid and blood came from the wound. Bichloride solution and cold water were now ordered. In spite of this treatment the lid swelling increased more and more, and a slight general œdema came on. This increased slowly from day to day, the lymphatic glands in front of the ear and at the angle of the jaw became enlarged, the incised portion and the neighboring tissue took on a grayish color, and soon broke down. Pyoktanin had no influence on the destructive process, which increased rapidly.

On May 6, therefore, the ulcer was thoroughly cauterized by Dr. Alt, by means of the galvano-cautery, and from that time on it healed gradually.

The patient was seen daily. After the cicatrix had formed, the lid remained swollen, of a peculiar copper color, and with the advent of folds in the skin of the lid a furfuraceous desquamation took place; this continued for a couple of weeks; likewise a blepharitis was developed, continuing for about ten days. Pyoktanin was again used after the cautery for a day or two. Since it did no good, in fact, appeared to irritate (1-1000), its use was suspended and bismuth subnitrate and iodoform were used alternately. The blepharitis was treated by means of an ointment of aristol (20 gr.-3ij), and yielded, although not rapidly so.

After the incision had been made it was clear that this was

no ordinary hordeolum, though before that it certainly looked as much like an hordeolum as could well be.

After the sloughing set in and played such havoc with the lid, it was concluded that here was phagedenic *chancroid* of the upper lid, as the diagnosis of chancroid of the penis could hardly have been disputed.

The absence of suppurating glands in the groin was noticeable and remarkable, though it was feared that the buboes on the side of the face, the result of the ulcerating sore on the lid, would suppurate. This did not, however, occur.

In the latter part of June a cutaneous efflorescence made its appearance on the chin. Later on, the side of the nose, then the whole face, and lastly the trunk and extremities were involved. When first seen, it looked like an ordinary acne papule; later on, the base became broader, the elevation less marked and central desquamation was observed. The papules were tender on pressure. Dr. J. B. Keber, Professor of Dermatology at the Beaumont Hospital Medical College, was now consulted, and his opinion was that it was a syphilide, and he pronounced it a maculo-papular syphilide.

The history of a sore on the penis, followed by a sore on the lid which, until aggravated, behaved like any chronic granuloma, and the subsequent appearance of the cutaneous manifestation scarcely leave room for doubt as to the diagnosis of syphilis, and that the growth in the right upper lid was a chancre; whether inoculated thereon from the penis or not, may be doubted.

Had the eruption not appeared, this case would, undoubtedly, have been reported as something extremely unique and rare in ophthalmological experience, a chancroid of the lid. Had successful early specific treatment been instituted, an error would most likely have been made. At one time in the course of treatment and observation, the thought was advanced that the chancroidal inflammations were progressing on syphilitic soil, and the surgeon in charge of the patient was asked to give him specific treatment. He prescribed pills of the protoiodide of hydrargyrum, with the result, in twenty-four hours,

of seeing much that he had gained, lost, the sore having begun to ulcerate again, and very viciously. The administration of the mercurial was suspended, nitric acid applied again, and another start made toward recovery. There was nothing observable about the lid at the time, because it was gradually getting worse and worse, as it was, and the attempt at treatment (constitutional) was made before the cautery was used.

The patient is now getting well under antisyphilitic treatment.

CORRESPONDENCE.

CHICAGO, June 29, 1891.

Adolf Alt, M.D., St. Louis, Mo.,

MY DEAR DOCTOR.—Your article will appear in the next number of the *North American Practitioner* in full. I regret very much that you should have taken so much notice of a little editorial which was taken from the press more as entertaining reading matter than serious communication. Your position in medicine is too well known for any one to take the matter seriously.

Regretting very much that this should have happened and trusting it may teach the editors wisdom, I am,

Very respectfully yours, BAYARD HOLMES,
Editor *North American Practitioner*.

SOCIETY PROCEEDINGS.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

43 PRATT STREES, }
HARTFORD, July 20, 1891. }

The Twenty-seventh Annual Meeting of the American Ophthalmological Society will be held this year, beginning on Wednesday, September 23, at the Arlington House, Washington, D. C. The rates for members and their families are \$4.00 per day, at the Arlington House. Special rates will probably be made by the different railroads, and announced in connection with the forthcoming programme of the Second Congress of American Physicians and Surgeons, in connection with which this Annual Meeting is to be held.

This Annual Meeting is in connection with the Second Congress of American Physicians and Surgeons, and takes the place of the usual July meeting.

Invitations to attend the Congress have been extended to a number of the most noted ophthalmologists abroad.

Titles of the following papers to be read at the Meeting have been received, and will take precedence on the bulletin:

Dr. C. S. Bull.—1. Gouty Retinitis—Neuro-Retinitis and Chorio-Retinitis.

2. History of case of brain tumor with autopsy.

3. The operative treatment of Detachment of the Retina by Schöler's method with report of five cases.

Dr. F. M. Wilson.—The use of Vaseline in gonorrhœal conjunctivitis.

Dr. P. A. Gallan.—Case of orbital traumatism followed by

immediate monocular blindness due to fracture of the foramen opticum.

Dr. H. Derby.—The significance of macular changes in advancing myopia.

Dr. F. Buller.—Glaucoma after extraction of cataract.

Dr. H. S. Oppenheimer.—The Blind of New York City.

Dr. G. E. De Schweinitz.—1. Additional experiments to determine the lesion in quinine blindness.

2. A case of Elephantiasis of the eyelid.

3. A case of Acute Glaucoma occurring in an eye with Coloboma of the iris and supernumerary pupils. (The first two papers illustrated by photo-micrographs and microscopic slides.)

Dr. C. A. Oliver.—A clinical study of the ocular symptoms found in the so-called Mongolian type of Idiocy.

Dr. E. E. Holt.—Extraction of foreign bodies from the Vitreous.

Dr. Swan M. Burnett.—Contributions to the study of heterophoria.

Dr. D. Webster.—Report of cases of cataract extraction.

Dr. S. B. St. John.—Extraction of foreign bodies from the interior of the eyeball.

Dr. B. L. Millikin.—A partially bony growth of orbit—removal—recovery.

Dr. D. De Beck.—Clinical studies in scotoma scintillans.

Dr. A. G. Heyl.—Retinal vessel observations in contusion of the brain.

Dr. J. A. Andrews.—1. Ulcerative keratitis in the Negro.

2. Eye complications in La Grippe.

Dr. S. Theobald.—1. Subnormal accommodative power in young persons a not infrequent cause of asthenopia.

2. A case of successful skin grafting upon the eyelid by Thiersch's method.

3. Supplementary note to the case of useful vision maintained by the aid of a totally dislocated lens, heretofore reported to the Society.

D. H. Knapp.—1. The occurrence, prevention, and management of prolapse of the iris in extraction of cataract.

2. Demonstration of a roller forceps for pressing out trachomatous granulations according to the mangle principle.

Dr. J. C. Kipp.—1. Recurrent inflammation of Tenon's capsule of both eyes in connection with mercurial poisoning.

2. Phlegmon of the orbit in the new-born.

3. Gangrene of the skin of both lids in both eyes.

Dr. L. Howe.—On the measurement of simple and compound lenses.

Dr. J. A. Lippincott.—Routine syringing-out of cortical matter in cataract extraction as illustrated by 100 cases.

Dr. Geo. Strawbridge.—Two cases of intense vertigo, produced by an attempted correction of astigmatic refraction.

S. B. ST. JOHN, Secretary.

SELECTIONS.

HOW TO USE MYDRIATICS.

At a meeting of the Philadelphia County Medical Society, on June 24, Dr. Edward Jackson read the following paper:

The present purpose is to discuss methods, not indications, for using these drugs; but, in passing, it is worth repeating, since it is so often forgotten, that remedies of this sort are too powerful to be used indiscriminately. If one has not been able to make a positive diagnosis in a case of ocular inflammation, to clearly recognize the indications, and to definitely exclude the contra-indications for one of these drugs, he should let them alone, and confine his hit or-miss prescribing to such drugs as boric acid or weak solutions of common salt, whose power for harm is really very slight.

These drugs are applied to the eye for their direct influence on the cornea, iris or ciliary body. In either case they must be absorbed through the cornea, the lymph streams of which are in close relation with those of the anterior chamber. Any portion of the drug that may be absorbed from other parts of the conjunctival sac is carried into the general circulation without coming in contact with the structures it is intended to influence. Any solution placed in the conjunctival sac is almost immediately diluted by the lachrymal secretion present; only the part with which it first comes in contact receives it of full strength. Now, if the amount of fluid instilled is very large as compared with the amount of tears diluting it, the dilution is of very little importance. But instillations of large amounts of mydriatic solutions are not advisable, because they give the maximum of absorption into the general circulation with the

minimum of effect on the eye. And one thing to be constantly guarded against in the use of mydriatics is the excess of constitutional action. Therefore, a mydriatic solution used in the eye should be instilled so as to come immediately in contact with the cornea while of full strength—that is, it should be placed at the upper margin of the cornea, allowed to flow over the surface of that membrane, and the closure of the lids prevented as long as possible, to allow absorption to occur before the fluid is swept away by the movements of the lids and diluted with the tears.

Instilled in this way, the concentration of the solution when it comes in contact with the corneal tissue, and consequently the amount absorbed, may be ten times as great as if the single drop of the same solution had been placed in some other part of the conjunctival sac. Thus applied, a very small drop of solution suffices to bathe the whole cornea. A dropper giving a small drop is therefore to be chosen. One is readily obtained with a small point that will drop half minims, or even less. The use of such a dropper allows the employment of stronger solutions than it would otherwise be safe to employ, or a larger number of instillations may be made in the same space of time without producing symptoms of mydriatic poisoning.

It is by attention to such a minute point of technique that one surgeon will at once secure the dilatation of an inflamed iris, or the complete relaxation of the accommodation under homatropine, where another less careful will fail to attain the end sought, or to give relief to his patient. And even where the utmost power of the mydriatic does not need to be exerted, to obtain the effect that is required with the least danger of constitutional symptoms, or with the minimum of constitutional disturbance, is a very important point; for these symptoms, though really not indicating any danger to life, are extremely annoying and alarming to the patient. They occur quite frequently after the use of mydriatic solutions, and such occurrence has much to do with the objection of patients to the use of mydriatics in the diagnosis of ametropia.

The strength of the solution of one of these drugs to be used in the eye varies with the purpose for which it is used. To break up the adhesions in a case of iritis, the stronger mydriatics are to be employed and in strong solution—as atropine sulphate 1 to water 50, or about 10 grains to the fluidounce; daturine sulphate 1 to water 100, or about 5 grains to the fluidounce; duboisine sulphate 1 to water 100, or about 5 grains to the fluidounce; hyoscyamine sulphate or hydrobromide 1 to water 100, or about 5 grains to the fluidounce. The effect of either of these solutions may be somewhat increased by using cocaine with it. But the patient should not be intrusted with the cocaine solution for home use, because the temporary comfort it gives in many cases leads sometimes to dangerous excess. Either of the above solutions is to be used one small drop in the eye at a time at intervals of ten minutes until the dilatation of the pupil is secured, and then at such intervals as may be necessary to maintain such dilatation, and continued three times daily until it can be replaced by a weaker solution.

In making the mydriatic attack on a case of plastic iritis, it is, to a certain extent, simply a question of whether we can get enough of the mydriatic into the eye without getting too much into the general circulation; and to accomplish this we must prevent the solution from making its way into the tear passages, and so being absorbed from the respiratory and digestive tracts, as well as from the conjunctiva. For this purpose it is often recommended to make pressure on the inner canthus. But such pressure is quite ineffective. Even the placing of a little clamp on each canaliculus, as proposed by Dr. Tansley (*Transactions of the American Ophthalmological Society*, 1888), does good mainly by the displacement of the puncta that it causes. The most effective means is to so draw on the skin of the lids as to evert the puncta, and hold in contact with them a small pledget of dry absorbent cotton. This will prevent the passage of any fluid from the eye into the lacrymal sac, and permit us to apply the mydriatic vigorously to the cornea.

For paralyzing the accommodation of the eye, solutions of

the same drugs of about half the above-mentioned strengths may be instilled three or four times daily.

Probably a single efficient instillation of this kind, or at most two or three, would be sufficient to produce complete paralysis of the accommodation in almost every case, with the eye in anything like normal condition. But frequently the instillation must be intrusted to unskilled hands, and so may produce but a small fraction of its full effect, and in a few cases the active hyperæmia, caused by the mydriatic and involving the anterior segment of the globe, may increase the difficulty of attaining complete ciliary paralysis; so that it may be necessary to continue such applications for some days.

For simply paralyzing the accommodation, however, our most valuable agent is homatropine, commonly used in the form of the hydrobromide. Of this two or three per cent solution, 10 or 15 grains to the fluidounce, should be instilled every five or ten minutes until at least four efficient applications have been made. Used in this way, I have found it a perfectly reliable and efficient paralyzant of the accommodation, even in the presence of high grades of retino-chorioidal irritation and general hyperæmia of the eye. But we have not with this drug the excess, or reserve of power to control the ciliary muscle, that is possessed by the other mydriatics named. Every instillation, or at least a sufficient number of them, must be efficient. The cornea must have the chance of absorbing the solution at nearly its full strength; and for that reason the application of the drug must be intrusted only to skilled hands, usually attended to by the surgeon himself.

To bring about simple dilatation of the pupil our choice of the drug will be determined by whether the dilatation is to be long sustained as a measure of treatment, or only temporary as for purposes of diagnosis. In the former case atropine is to be used, in the latter homatropine or cocaine. Atropine or homatropine should be employed in a solution one tenth the strength of those used for paralyzing the accommodation, or even weaker than this. The atropine to be repeated as often

as the pupil contracts again, say once every one, two, or three days; the others, of course, used only the once.

Cocaine, which is of especial value as a dilator of the pupil, is to be used in solutions of the ordinary strength ordinarily employed for producing local anæsthesia of the eye, that is, 2 to 4 per cent. But the instillation must be made at least thirty minutes, often an hour, before the dilatation is desired; the anæsthetic action often having quite passed away before the dilatation of the pupil becomes noticeable, and repeated instillations do not very greatly hasten this dilatation. As a paralyzant of accommodation cocaine has very little power, and by itself is not at all valuable for the purpose. But it can sometimes be advantageously combined with homatropine. Here the frequent repetitions of the instillation, as in the case of iritis, give the advantage of local anæsthesia, greatly lessened resistance on the part of some patients, and prevention of the excessive secretion of tears that follows each instillation of homatropine alone, and by dilution of the solution lessens the intra-ocular effects produced, as well as an apparent hastening of absorption. For this purpose the solution may be made with 2 or 3 per cent each of cocaine and homatropine.

The instillation of a strong solution of any of the mydriatics causes a pericorneal hyperæmia, which, though not serious, is sometimes alarming to the patient or his friends. This phenomenon I pointed out in a paper on homatropine, published in the *Medical News* for July 18. It is especially liable to occur from the use of homatropine, because this is more likely to be used in stronger solutions. The combination with cocaine lessens this tendency to a considerable extent.—*New York Med. Jour.*

EXTRACTION AND AFTER-TREATMENT OF CATARACT.

BY DR. VALUDE.

Translated from the French by Dr. Theo. Frantz for the *Medical Progress*.

The extraction of cataract has been the subject of much discussion. The number of communications brought before each medical congress concerning the technique of the operation, and the different methods of after-treatment disclose the fact that there is quite a variety of operations for cataract extraction, and the subject is worthy of still further consideration. I will endeavor to be brief and will not attempt to make a critical review of the various operations, but will endeavor to give you the most rational and successful method as deduced from my long experience, giving my reasons for each step in the operation and after-treatment. In the first place, I will speak of only the simple forms of cataract, the senile, or hard, and the soft cataract. For this variety simple extraction without iridectomy is the preferable operation. (It will not be necessary to refresh your memory with the different opinions of times past, between the extraction with iridectomy and the simple extraction). Knapp has said time, and again that the simple extraction (the modified operation of Daviel) is altogether the safest, best and neatest operation, inasmuch as the physiognomy of the eye is not altered. The only two reasonable objections to this method, viz.: the enclosing of the iris in the lips of the wound, and the frequency of secondary cataract, can be easily overcome by the methods I give further on. The enclosing of the iris in the lips of the wound is very rare after the operation as described by me, with my method

of after-treatment. By referring to my statistics of several hundred cases I find this complication has occurred in only four per cent. of the cases; such percentage constitutes not only very little danger but excels the method of Von Græfe, even his modified method. The danger of secondary cataract is almost abolished by skillful manœuvres in the expulsion, and by the intra-ocular cleansing after the operation.

The secondary operation is, as a rule, followed by good results—if the discission with needles or the cystotome, or a careful extraction with forceps be done. Knapp has certainly impressed the medical world by statistics recently published on this subject. Knapp's statistics for secondary operations record numbers of eyes not only restored to their normal function, but with elevation of visual acuity. The practice of simple extraction without iridectomy seems to be unquestionably advisable in every simple case, if no other indications are present. I will describe first the operation proper and then the after-treatment. Prior to the operation I never use on the patient either atropine or eserine, the latter I never use, even during the after-treatment, for reasons given later on. Concerning atropine it is true that its power of dilating the pupil facilitates the discission, but loses its value when the aqueous humor escapes, contraction of the pupil following. I subject the eye to cocaine several minutes previous to the operation. I then proceed to cleanse the conjunctiva and lids with a bichloride solution of 1 to 5,000. This can be done effectually by wrapping a probe with absorbent cotton and saturating it in the bichloride solution. This little arrangement enables me to reach every fold in the mucous lining. It is a well known fact that we can not pay too much attention to the protection against the microbes of the conjunctiva. The lachrymal apparatus must be looked after to see there is no discharge from the sac. The instruments for a simple extraction, as I perform, are a pair of fixation forceps and a Von Græfe knife, whose use requires an assistant to keep apart the lids. As a rule, in ordinary practice I use in addition to the above a wire speculum, a spatula and a curette. The curette I use in order to express

the lens through the incision; the spatula will be useful in the reduction of the iris. These instruments are never boiled or submitted to dry heat, on account of their delicate structure. I render them antiseptic by a bath in a solution of cyanide of mercury 1 to 100; a few minutes are sufficient for thorough antiseptis. This solution is preferable to the bichloride or the borated solutions from the fact that it does not affect the instruments. In ocular surgery the carbolated solutions are contra-indicated on account of their irritating properties; alcohol and hot water are doubtful antiseptics, according to my experience. I am fully satisfied with the cyanide solution for the instruments and the bichloride for the preparatory cleansing of the eye. After thorough cocainization of the eye I proceed to operate. I make my incision at the limbus of the cornea, constituting a flap of about one-third of the circumference of the cornea. This flap is placed in most cases above. I think that the position of the flap on a level with the limbus, neither in front in the cornea nor behind in the conjunctiva is the one which is the least exposed to the danger of enclosing the iris in the incision; it is also the flap in which cicatrization is most rapid. Though I practice the section of the cornea with the Von Græfe knife, I follow the old method of bringing the point of the instrument toward the center of the pupil, so as to open the lens capsule with the point of the knife. After discission I make my counter-puncture; this constitutes the first two stages of the operation. The rapidity of these steps will determine the success of the operation. The great advantage of the discission with the knife is that the cystotome is introduced with some difficulty into the eye, may become entangled in the iris and do great mischief. It is an instrument that is very difficult to cleanse. Such being the case, the knife of Von Græfe is the only instrument I dare to introduce into the eye. This kerato-cystotomy being performed, the next step will be the expulsion of the crystalline lens, which I favor by pressure and counter-pressure, either with the fingers, the eyelids intervening, or with a spatula or curette; the soft masses are removed with the curette. If some of the soft matter

should resist the pressure and counter-pressure, its removal can be effected by passing a current of hot borated water into the anterior chamber. I use willingly but not systematically the intra-ocular method of cleansing. After the operation I come to the dressing; I never use eserine after the operation. The dressing for cataract, as I understand it, should essentially be dry and small. A round piece of salol gauze applied directly to the eye, a few layers of antiseptic absorbent cotton, round in shape, and a piece of oil silk will constitute the whole outfit. I do not remove the dressing before the fourth day, even if the patient should complain of some pain. Even in a case where I do suppose that the iris has become enclosed in the wound, I shall not remove the dressing at least before the third day. My reason for this is the imperfect cicatrization of the wound before that time; it may reopen under the slightest disturbance and the iris flow into it. I have seen such a case, where for special reasons, I removed the dressing on the second day; this I took for a valuable lesson in my later operations. On removing the dressing on the third or fourth day the wound has closed and the anterior chamber has become refilled and the eye is free from irritation. I then drop atropine in order to break up all synechiæ, then put on a light bandage, which has to be worn for two days. The fourth day the patient is able to sit up, and on the eighth day, if everything has been normal, I dismiss the case. While the first dressing is on I keep the patient in a well-lighted room, instead of condemning him to darkness. This brings us to the conclusion that a great step has been made in the expediency of the operation and after-treatment for the benefit of the patient.

DISEASES OF THE EYE OF MALARIAL ORIGIN.*

JAMES L. MINOR, M.D., MEMPHIS, TENN.¹

Of all diseases, there is none more protean in character than malaria; and in this district, where malarial poisoning is so common, it is important that it should be recognized in all of its various forms. And while a proper appreciation of malarial manifestations in the body as a whole is *sine qua non* to professional success, it is further necessary for us to be acquainted with its effects upon special organs. I have selected the eye, and shall attempt to present a brief resume of what is known concerning diseases of this organ of malarial origin; and while I shall present my own opinions, I shall not hesitate to borrow from others who have written upon the subject—and chiefly from a monograph by Dr. C. J. Kipp, of Newark, N. J.

Diseases of the eye arising from malarial infection may be advantageously grouped under three headings: (1) Those accompanying paroxysms of malarial fever; (2) those coming on after such an attack; and (3) those diseases of the eye which may be the chief manifestation of malarial poisoning.

1. We will consider those eye affections accompanying the paroxysm of malarial fever. Photophobia, lachrymation, and hyperæmia of the conjunctiva and of the iris, may accompany the pyrexial stage. Iritis has also been observed. Amaurosis is sometimes seen during the paroxysm—usually in both eyes. It most frequently begins during the chill, and, continuing through the hot, passes off with the sweating stage, and may or may not be accompanied by headache, pain in or redness of the eyes, or by other symptoms. Occasionally the blindness affects only one-half of the field of vision. The ophthalmos-

¹Extracted from Trans. of Med. Soc. of State of Tenn. (53d Annual Meeting).

copic appearances are negative, and the pathology of this form of amaurosis is unknown.

2. Those diseases of the eye which follow, and are apparently caused by malarial fever, may attack almost any portion of the globe. Dr. Kipp thinks that "the disease most frequently observed in this connection is a superficial ulceration of the cornea." This he was the first to notice, and he thus describes it: "This ulceration of the cornea is commonly first noticed shortly after an attack of intermittent fever, often simultaneously with the appearance of herpetic vesicles on the nose and lips. In a number of my patients who had annual visitations of this fever, each attack was followed by ulceration of the cornea. In all of the cases that have come under my notice only one eye was affected. If the eye is examined shortly after the first symptoms of irritation are noticed, one or two or more slightly raised irregular opaque lines of varying length will be found on different parts of the surface of the cornea. At the same time some circumcorneal injection will be present. On the following day these opaque lines will have increased in length, whilst at the same time the middle portion of the opacity has been transformed into a shallow ulcer. Under favorable circumstances the reparative process is completed in several weeks;" while unpromising cases may remain longer or grow worse. Preceding and accompanying the ulceration there are photophobia, lachrymation, and pain in and around the eye. This form of ulceration of the cornea differs from the vesicular eruptions seen in pneumonia and other febrile diseases in the method of development, as described.

Diseases of the uveal tract (iris, ciliary body, and choroid), while rare, do occur, in the form of serous iritis or exudative choroiditis, and occasionally as suppurative choroiditis, with loss of vision and shrinkage of the globe. Serous effusion into the vitreous has been noted and described by Dr. Seeley of Cincinnati. In chronic malaria, hæmorrhages into the vitreous are not infrequently seen; and retinal hæmorrhages have also been observed, and a peculiar form of retinitis, resembling

that seen in Bright's disease, has been described. Both optic neuritis and optic nerve atrophy have been observed after intermittent fever, and it is claimed that these not infrequently occur, though I have never seen a case of the kind.

The amblyopia, sometimes seen with intermittent fever of long standing, would seem in many instances to depend upon albuminuric retinitis.

3. We finally pass to those diseases of the eye which may be the chief manifestation of malarial poisoning, and my own observation leads me to think that the most frequent malarial manifestation in the eye is a form of conjunctivitis, which, by the way, is so marked in its peculiarities and accompaniments that its malarial character may be confidently asserted before inquiry is made for it. The inflammation is of a low grade, and it affects both the palpebral and ocular conjunctiva. The discharge is scanty, and is more serous than purulent. The blood vessels are engorged, and the whole appearance is suggestive of a sluggish circulation. There is circumcorneal injection, and there may be spots of abrasion of the epithelial covering of the cornea. The pupils are large and rather inactive, but there is no iritis. The tension of the globe is slightly reduced. The patient complains severely of pain—not so much in the lids as in the globe, and particularly in the supra- and infra-orbital regions. This pain is apt to be worse on certain days or at certain hours than at others, and pressure upon the supra- or infra-orbital nerve causes sharp pain. The entire mucous covering of the lids and of the globe is markedly anæsthetic to superficial irritation. Local treatment in such cases does little or no good, and recourse must be had to the liberal administration of quinine; and to relieve the pain or neuralgia, I have often been obliged to give morphia, and think that I have obtained the best results when it has been combined with gelseminum.

"Intermittent amaurosis has also been observed in cases of latent periodic fevers, in which slight nausea, or some chilliness, or perhaps moderate perspiration, were the only symptoms present. The attacks of blindness, which, according to

Himly, are more frequently confined to one eye in this form of fever, assume quotidian, double-quotidian, or tertian type, although the latter is most common. The duration of the attack varies from a quarter of an hour to ten hours or more. If the blindness recurs every night, this affection may bear some resemblance to night blindness—hemeralopia; and this explains, perhaps, the statement of some authors that night blindness is sometimes caused by intermittent fever. In an interesting case of this kind reported by Staeber, the patient was at first supposed to suffer from night blindness, until some days later the time of the recurrence of the amaurosis was delayed, and an attack of complete blindness in both eyes came on in broad daylight. Quinine speedily cured the attack. This form of intermittent amaurosis is also frequently accompanied by headache, supra-orbital neuralgia, photophobia, blepharospasm, lachrymation, and vaso-neuroses of the eye. In some cases tenderness of the spine was present. The recurrence of the attack was in all cases prevented by sulphate of quinine.”—Kipp. (*Memphis Med. Jour.*)

CHLORATE OF POTASSIUM IN PHLYCTENULAR ULCERATION OF THE CORNEA.

BY W. C. BANE, M.D.

It is almost a century since chlorate of potassium was brought to the notice of the medical profession as a remedial agent. In 1795 Dr. Garnet, of England, used it in the treatment of disease. At one time it was lauded as almost a specific in many of the maladies to which mortal man is heir. However, years of clinical experience determined its real value, and it was assigned a place among the topical remedies. Though valuable when administered internally, in some conditions of the system it has its deleterious effects, having already caused forty-seven deaths. Its therapeutic properties may be stated generally as those suggested by its chemical constitution and affinities; as a salt exceptionally rich in oxygen, it has without decomposition, the valuable property, *per se* by its mere presence apparently, of oxygenating or aerating the blood, and so restoring or exalting this inherent quality of the circulating fluid, influencing to a corresponding degree nutrition and functional activity of the various tissues and organs of the body.

In ulcerative diseases chlorate of potassium has been thoroughly tested during the past forty years both internally and locally. Under Therapeutics, in the *North Amer. Medico-Chirurg. Review* for March, 1858, p. 387, Dr. Dethan regards chlorate of potash "as an especial and incontestible remedy in ulcero-membranous stomatitis * * its topical application is sufficient, and in a short time the mucous membrane recovers its normal qualities and functions."

Dr. Gallaher, of Pittsburg (*Am. Journal Med. Science*, July, 1857), lauded chlorate of potash in mercurial stomatitis, stating that, "should there be ulceration of any portion of the mucous membrane of the mouth, I desire a weak solution of the salt to be applied to the denuded part several times a day; generally nothing else is required, the cure being accomplished in a few days." As a local application in ulcers of the lower bowel, chlorate of potassium in solution gives excellent results, ulcers healing rapidly.

I presume chlorate of potassium has frequently been used as a local application in diseases of the eyes, but I have only found one record, that of Dr. Landesberg, of Philadelphia, using it as a topical application in epithelioma of the eyelids.

Ulcers of the cornea, especially the phlyctenular variety, are frequently met with, usually developing as a little papule or pustule on or near the margin of the cornea. They may develop independently or as a complication of some existing ophthalmia or catarrhal affection of the nares. A large percentage of the cases are strumous or scrofulous, consequently suffer from nasal catarrh.

The symptoms may vary as to their intensity, but we usually find photophobia, congestion and pain, the variation in the symptoms being influenced by the number of phlyctenules and the constitution of the patient. Constitutional treatment and regulation of the diet, etc., is invariably needed.

The first use I made of chlorate of potassium as a local remedy in ulcers of the cornea was in a case of serpiginous ulcer in January, 1882. Case—Mrs. S. C. H., æt. 50, constitution feeble. Having exposed herself in doing some outdoor work while the weather was rough, had developed an ulcer in the upper, outer quadrant of the right cornea. When I first examined the eye the ulcer was about 2×3 mm. in size. There was photophobia, congestion of the conjunctiva and subjacent tissues; eyeball, right side of the face and head painful, constitutional remedies prescribed. Locally atropia and weak solution of biborate of soda. One week later the ulcer had doubled in size and depth. Atropia acted as an irritant, mor-

phia disagreed, they were both discontinued. As chlorate of potassium had served me well in ulcers of other portions of the body, I determined to test it on the corneal ulcer, and so directed a five-grain solution to be instilled into the eye, as warm as could be borne, three or four times daily. From the time the chlorate was used the ulcer began to heal. Owing to loss of tissue there remained an opacity. Instead of morphia the patient was given hydrate of chloral with bromide of potassium; though chloral when administered internally acts as an irritant to the eyes in some cases, in this case it did not.

During the past five years of special practice, nearly four years of which I have had charge of the eye and ear department of the dispensary of the Western Pennsylvania Medical College, some fifty-six cases of ulcer of the cornea have come under my care. About two-thirds of these cases were of the phlyctenular variety. The chlorate has rendered good service in different forms of ulcers of the cornea, but rather better in the phlyctenular than in the other varieties. Not all of these cases were treated with the chlorate, as in some the washed mild chlorate was applied, in others the ointment of the yellow oxide of mercury, and in a few weak solutions of the bichloride of mercury.

In the limited experience I have had in the treatment of corneal ulcers and the use of the above remedial agents, my convictions are that the chlorate in about five grain solution used quite warm three or four times daily is the most soothing and heals the ulcers more rapidly than any of the other agents tested. True, the warm water itself is of great advantage, but the chlorate is a valuable addition on account of its antiseptic action. It does not prevent bacterial evolution, but it does retard chemical decomposition of organic fluids.

DR. LIPPINCOTT.—I never use chlorate of potassium in such cases. We have so many old remedies which will answer the purpose. I have found in my experience that the direct application of very hot water to the cornea is a good thing in these ulcers. The one class to which the doctor refers, generally extremely obstinate, I have treated by the direct application

of water at a boiling temperature or steaming. I put a drop of water directly on the exposed cornea so that it steams as it comes out. One drop of the water touches the ulcer, and the effect is marvelous in some cases. The first case I tried it in was a little boy, aged about six years, who had been under treatment for a good while. Treatment had been followed for about three weeks without any material change for the better, and it occurred to me one day to apply the hot water in that way. Before that time could get no dilatation, none whatever, but after the first effort with hot water, the pupil dilated very widely indeed. A good recovery was made. Heat is applied constantly of course, but this was a new application of heat. This hot water treatment, it seems to me, is milder than applying a red hot iron to the ulcer. It seems to destroy less tissue than the hot iron, and it certainly answers the purpose in so far as my experience has gone.

DR. BANE.—I simply wanted to bring this matter out. Hot water is certainly beneficial, as Dr. Lippincott has stated, but it seemed to me that the chlorate shows an advantage, at least it has done so in my experience.—*Cincinnati Med. News.*

INHERITED MONOCULAR MYOPIA.

BY DR. THEOBALD.

Dr. Theobald reported a case of inherited monocular myopia, occurring in a lad, æt. 9. As the eyes were not examined in early infancy, there was no positive proof that the ocular defect was congenital, but it seemed highly probable that such was the case. The right eye, which squinted outward to a scarcely perceptible degree, and was decidedly amblyopic, exhibited a myopia of 10 D. There was a general thinning of the choroido-retinal pigment; but no other noteworthy ophthalmoscopic changes were present. The vision of this eye could not be improved by any glass beyond $\frac{20}{cc}$. The left eye showed a slight amount of hypermetropic astigmatism, according to the rule, with $V=\frac{20}{xv}$. The mother of this lad, a lady, æt. 41, had a marked divergent squint of the right eye, which had existed for many years, and in this eye there was a myopia of 13.50 D., with $V=\frac{20}{c}$. The ophthalmoscope showed a rather large, well-defined crescent, with no outlying choroido-retinal changes. In the left eye there was a low grade of compound hypermetropic astigmatism, according to the rule, which had given rise to asthenopia, and for which reading glasses had been prescribed. The occurrence of asthenopia in the left eye of the son was the occasion of his being brought for advice, and in his case, also, a cylindrical glass for this eye was prescribed. Both mother and son depended entirely upon the sight of the left eye in distant as well as in near vision. The parallelism between the condition of the eyes in the two was very striking, and constituted the interesting feature of the cases.

The myopic history of the family in which these cases occurred was also interesting. The maternal great-grandfather and great-grandmother of the lad were both myopic, and perhaps astigmatic, though of this there is no proof. The myopia of the former, as indicated by his glasses, was in the left eye 5 D; in the right eye 5.50 D. The myopia of the latter, tested by Dr. Theobald, when she was over 70 years of age, and when there was some cortical opacity in each lens, was in the left eye $\frac{1}{8}$, in the right $\frac{1}{12}$, myopic crescents being found in both eyes. As a result of this intermarriage of myopes eight children were born. The refractive anomalies which they and their children and grandchildren exhibited were shown in the following table, which Dr. Theobald thought presented strong evidence against the advisability of myopes intermarrying.

Myopia as-
tigmatism in
each eye, the
astigmatism
in one eye
amounting
to about 4D.
permetrop-
ic astigma-
tism. They
wear cor-
recting
glasses.
155°
R—.37c.

astigmatism;
wears cor-
recting
glasses.

permetrop-
ic astigma-
tism. R. eye sim-
ple hyper-
metropic
astigma-
tism; wears
correcting
glasses.
hypermetro-
pic astigma-
tism of low
grade; wears
correcting
glasses.

DAUGHTER.
Myopia of
high grade
in one eye,
and of lower
degree in
other eye, no
children.

DAUGHTER.
Hypermetropic
astigmatism; wears
correcting glasses;
no children.

SON.
Compound
myopic astigma-
tism. Correct-
ing glasses are:
L—175°/185°—1/12c
R—160°/185°—1/30c

DAUGHTER.
L. eye slight
compound
hypermetro-
pic astigma-
tism. R. eye M=
13.50.

SON.
Not known
to have had
refractive
error; no
children.

DAUGHTER
L. eye M=
1/10
R. eye M=
1/10

DAUGHTER.
Hypermetropic
astigmatism;
wears correct-
ing glasses.

SON.
L. eye compound
myopic astigma-
tism. R. eye simple
myopic astigma-
tism. Correcting glasses
are:
L—180°/305°—1/12c.
R—180°/45°—180°.

DAUGHTER
No evi-
dence of re-
fractive er-
ror.

SON.
Astigma-
tism which
will soon
require cor-
rection.

SON.
Compound
hypermetro-
pic astigma-
tism; wears
correcting
glasses.

SON.
L. eye
slight hy-
permetro-
pic astigma-
tism. R. eye M=
10.
Two young
children
not known
to have re-
fractive er-
rors.

ty high grade, ex-
act degree, and
whether astigma-
tism was also pres-
ent, not known.

myopic astigma-
tism. R. eye my-
opia of high grade.
With following
correction each
eye obtained:
 $V = 80/100$
 $L - 5.25 - 1.50c$
 70°
 $R - 8.5$

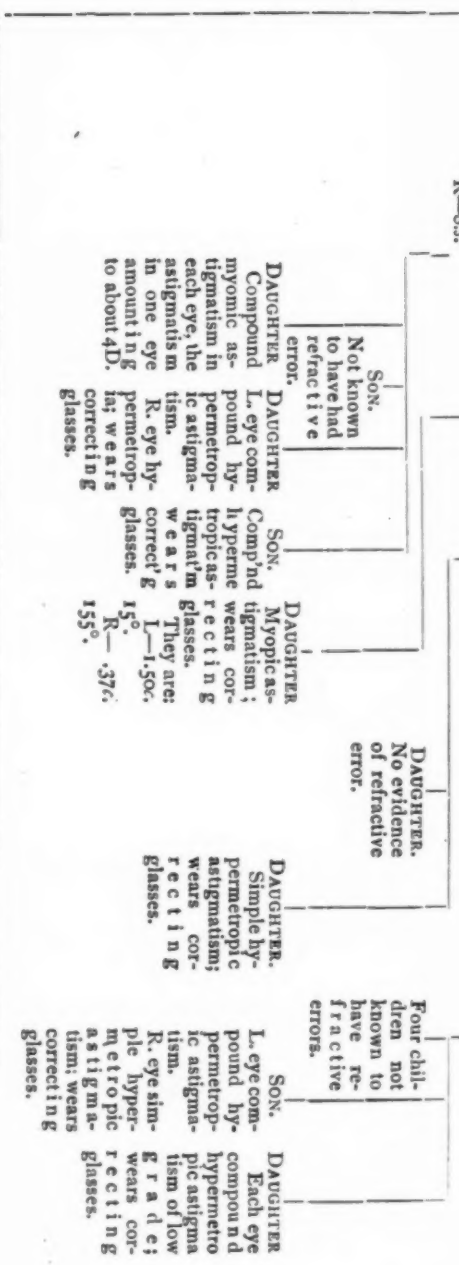
to have had
any refrac-
tive anom-
aly.

degree not
known; wore glass-
es; no chil-
dren.

astig-
hypermetro pic
astig. Correct-
ing glasses are:
 $L - 1/160 \text{ } \ominus +$
 $1/90c, 135^\circ$
 $R + 1/60c, 75^\circ$
No children.

astigma-
tism, but de-
gree and char-
acter have not
been deter-
mined.

myopic, de-
gree not
known; wore
glasses; no
children.



DAUGHTER. Myopia of high grade, wears correcting glasses; no children.

DAUGHTER. Hypermetropic astigmatism; wears correcting glasses; no children.

SON. Compound myopic astigmatism. Correcting glasses are:
 $L - 1/160 \text{ } \ominus - 1/175c$
 135°

DAUGHTER. L. eye slight compound hypermetropic astigmatism.

SON. Not known to have had refractive error; no children.

TABLE OF CASES OF INHERITED MYOPIA.

GREAT-GRANDFATHER.

L. Eye M=5.
R. Eye M=5.50

GREAT-GRANDMOTHER.

L. Eye M=5.
R. Eye M=3.25

He also had a brother who was myopic and a sister who was very myopic, and a nephew who has been near-sighted for years was recently found to have, also, astigmatism against the rule.

Her mother had a divergent squint, and one of her sisters lost her sight suddenly, probably from fulminating glaucoma.

DAUGHTER.

Myopia of pretty high grade, exact degree, and whether astigmatism was also present, not known.

DAUGHTER.

L. eye compound myopic astigmatism. R. eye myopia of high grade. With following correction each eye obtained:

$$V=\frac{10}{30}.$$

SON.

Myopia of pretty high grade.

DAUGHTER

Not known to have had any refractive anomaly.

SON.

Myopia, degree not known; wore glasses; no children.

DAUGHTER.

L. eye mixed astig. R. eye hypermetro pic astig. Correcting glasses are: $L-1/15^{\circ} + 2/30^{\circ} - 135^{\circ}$
 $R+1/60^{\circ} - 75^{\circ}$

SON.

Well-marked astigmatism, but degree and character have not been determined.

SON.

Both eyes myopic; degree not known; wore glasses; no children.

ON MINERS' NYSTAGMUS.

BY MR. SIMEON SNELL, SHEFFIELD, ENG.

After reading my paper before the Ophthalmological Society, in 1884, on "Miners' Nystagmus," I wrote in the pages of the *British Medical Journal* a letter, in which I earnestly solicited information from medical men attached to coal pits, and from others who might be interested in the affection, which would tend to elicit the truth whether it supported my observations or not. I concluded by saying: "My desire for facts is not merely to support the views I have expressed, but to arrive at the truth."

I have since availed myself of every opportunity to gather information which would aid in elucidating this, to me, most interesting malady. The result of all my investigations has been to corroborate in the fullest manner the observations I have previously published. It is my purpose in this article to set forth evidence in support of my contention that the prime cause of miners' nystagmus is to be found in the constrained attitude a certain proportion of the workers in a coal pit are compelled to assume at their work, and to show also how the question of safety lamps and illumination can only occupy a secondary position.

My conclusions are derived from an experience of more than 500 colliers, who have at different times been under my care for nystagmus, and I have records of 120 cases with which I propose specially dealing in this paper. Many points of interest and importance will have to be omitted, or mentioned very briefly, for want of space.

For the proper understanding of the subject a knowledge of the working of a coal mine is almost necessary; but, for its

thorough investigation, it may be safely asserted that an intimate acquaintance with the detailed working of a pit and the different ways which men are employed underground is of the first importance. With this end in view, I have not only obtained the assistance of Government mine inspectors, managers, and other officials, as well as the kindly help of many colliers themselves, but I have been down into the coal pits, seen the men at their work, and have by all these means become familiar with the interior of the mine and the various kinds of work in which the men are engaged.

The nature of the peculiar oscillations of miners' nystagmus I have previously described.¹ The ocular movements of a to and fro and rotatory character are associated with apparent motions of objects, and the manner in which the collier so affected sees his lamp dance or spin round, has, I think, a great deal to do with his impression that the "safety lamps" are the cause of his malady. The worker with candles also makes a similar complaint as to the motions of his lights.

The original Davy lamp consisted of a cylinder of wire gauze encircling a light whose illuminating power was considerably below one-fifth of a standard candle. Dr. Clanny introduced the use of glass for the lower part in place of the gauze, and these lamps have been used for many years. Further advances in the illuminating powers of safety lamps have also been made, and the Royal Commissioners on Accidents in Mines, who reported in 1886, speak favorably of the Marsaut lamp. This lamp is one of the four recommended by the Royal Commission, and is largely employed in the Midland district. Such a lamp gives two-thirds of the light of a standard candle, and three times and a half the light of a Davy. In the modern safety lamp the gauze is bonneted by a sheet-iron casing, which not only protects it from strong currents of air, but causes the flame to burn with a steadier and more uniform light. I know the miners object to the shadow cast by the bonnet, among other things, of the safety

¹Ophth. Soc. Trans., 1884.

lamp; but, as a miner, who had one time worked with a Davy lamp, speaking of a modern lamp, said very pithily, "It is daylight to the old one."

The alternative to the use of safety lamps in a coal pit is the employment of naked lights. In some places open oil lamps—"torches," as they are called—are in use; but when safety lamps are not employed, the illumination is generally effected by candles; for ordinary work these tallow candles are from sixteen to twenty to the pound. In the Derbyshire collieries the candles mostly used are eighteen to the pound; they are thin and long, and have a thick wick. The candle is fixed in soft clay, which makes it easy of attachment to the place where it best throws a light on the work. The influences of currents of air on the unprotected candle will be apparent, and in strong currents it becomes necessary for the light to be shielded either by a prop or other protection, and the quantity of diffused light is materially diminished.

A miner naturally, I think, prefers a candle. I have seen them both used in a mine. The candle is easier to handle, can be stuck in almost any position, and exposes a naked flame with a more diffused light. Many persons, however, have an erroneous idea of the comparative light-giving power of a safety lamp, and are apt to suppose that it refers to such candles as the miner uses, whereas the comparison is to the light emitted by a standard candle.

Through the kindness of a friend I have been able to obtain an analysis, by an expert, of miners' candles which were submitted to him. All I can do here is to say that no two burnt with regularity or similarity, that candles 18 to the pound emitted light varying from 36.80 to 73.60 per cent of the standard candle; and candles 16 to the pound 61.53 to 77.24 per cent of the light of the standard candle. It was only by snuffing and nursing the thick end of a 16 to the pound candle that a light was obtained exceeding that of the standard.

It has been asserted that nystagmus is now more common than it was formerly. I am not aware of any statistical information on the subject. As far as my personal experience

goes I certainly meet with more cases. This is not to be wondered at, considering it is well known that I have paid special attention to the subject. I am not aware, however, that these miners' cases have increased in any very undue proportion to the greater number of eye patients which come under my notice. A knowledge of the disease, however, has become more diffused among medical men. It is important, also, to remember the large increase in the numbers working underground. In 1869 there were 300,000, and in 1890, 506,812.

The advocates of the safety lamp theory, in insisting on the greater prevalence of nystagmus, appear to overlook the improved illuminating power of modern protected lights. An increase under these circumstances is rather an argument against the prominent place it is asserted that safety lamps occupy in the causation of the malady. As long as I have been acquainted with nystagmus, I have been equally familiar with the opinion of the collier that it is "all the lamps." There is a rooted prejudice, which sometimes is a hindrance to properly investigating a case; but, on the other hand, I have seldom failed to convince a miner coming for treatment that there was a more potent cause at work than the mere employment of his safety lamp.

It is often alleged by the advocates of the safety lamp theory that men suffering from nystagmus become improved when they leave a pit where safety lamps are used and obtain employment in a mine worked by naked lights. In view of the fact—which I shall be able to establish—that nystagmus is by no means infrequently met with in candle lighted pits such a statement is not of much moment. Several times the tale has been reversed. Men working in safety lamp pits have become worse on going elsewhere where naked lights were used, and others have failed to improve. The statement is frequently made, however, and therefore it may be well to analyse it somewhat. The essential thing is to be clear that the work pursued under the two varieties of illumination is as nearly identical as possible. This is of vital importance. A change of work would also have been beneficial in a safety lamp pit. Refer-

ence will be made further on to the fact, borne out by several cases, that a man who has suffered from nystagmus may continue his work in the pit as long as he discontinues the kind of employment which I shall show to be acting so prominently in causing this affection.

I have investigated cases of alleged improvement by simply changing from one pit to another, or from safety lamps to naked lights. Last year a collier, the subject of well-marked nystagmus, told me that his brother had suffered, had gone to work in a "candle pit," and had got better. It turned out on investigation that formerly he had been a stall man doing "holing"—work prejudicial, as will be presently shown. I went down into the pit, saw this man at his work, and now, as expected, it was different; crooked down on his haunches, with head upright, he was able to use his pick more directly forwards; he was, in fact, engaged at work which I should have permitted him to have done in a safety-lamp pit. No such cases of alleged improvement can be accepted unless the evidence is clear and distinct of a continuance of employment similar with naked lights to that followed when using safety lamps.

I come now to deal with the presence of nystagmus in men employing naked lights. The following interesting instance is among my cases:

G. H., came to the Sheffield General Infirmary on November 25, 1890. He was suffering from particularly well-marked nystagmus, and had been compelled to leave his work. His age was 38; he had been employed in coal pits for twenty-four years. At first he worked with candles, then for fourteen years together with safety lamps. During that time he experienced no ocular discomfort. For the last three years and a half he had been working in another pit, with candles and not lamps. His work had been the same as it was when using safety lamps. He had been a coal getter; to use his own words, he would "drive a heading and get the coal down by holing three or four feet under"—that is, undercutting the seam of coal. He dates the earliest symptoms back fifteen or eighteen

Another man who was present was employed in a safety lamp pit. He had worked fifteen years with candles, and later with safety lamps for ten years. His symptoms were quite recent, but he had not left work.

A twelfth case was seen at this visit. He was a "deputy," and reference will be made to this interesting case further on. He worked in a candle pit but employed a safety lamp, as his work was to examine the workings for gas before the men entered the pit.

I had another opportunity, in company with my friend Dr. Cocking, of examining most of these men; in fact, some I saw on three occasions. I saw, also, two other cases. One was a "deputy" similar to the other already mentioned; the second was a man, *æt.* 28, who had worked in a pit for eleven years. Up to twelve months ago he used safety lamps; since then he had been working with candles. The symptoms appear to have commenced about the time of ceasing the use of safety lamps; he has, however been getting worse since using candles. Besides these cases I found that the occurrence of nystagmus was well known among these men in candle-lighted pits. A father had a son afflicted, and a son a father; and further definite evidence was given me of the existence of several other cases which these men knew of, and which would have been gathered together for my inspection had circumstances permitted.

The information gained by this investigation is most valuable, and its bearing on the relation of safety lamps to the affection most important. Eleven cases were found among the candle men: Some had never used safety lamps at all, and the keenest advocate for the theory attributing the malady to their use could, in those other cases in which the use had been so little and so very occasional, hardly venture to suggest that they in any way owed their nystagmus to this cause. In the judgment of most it will be, I think, evident that the existence of such cases as I have mentioned absolutely prevents the acceptance of the employment of safety lamps as a prime cause, and they demonstrate clearly that nystagmus

does occur, and that frequently, in circumstances where such a cause is wanting.

Further evidence is furnished by the two cases to which reference is now made. For the present it is merely necessary to say that they were not practical colliers, but were engaged at the bottom of the shaft as "onsetters" attending to dispatching to the surface the tubs of coal. Now, anyone familiar with a coal pit knows that the bottom of the shaft is well lighted. In some collieries the electric light is employed, in others gas. In one instance large oil lamps were used; and in the other, as the patient said, "there is plenty of light from big paraffin lamps."

Here, again, nystagmus is found in circumstances in which the illumination can hardly be found fault with. A medical friend informs me of another similar case, but I have not yet seen the man.

In this connection may be mentioned the case of a young compositor working under ordinary illumination (gas), who developed nystagmus, vertical in character, the causation of which can, in my opinion, be traced to his work.

I have now, I think, advanced evidence proving not only the existence of nystagmus in the miners employed in naked-light pits, but also in circumstances in which the illumination can hardly be found fault with, and rendering it impossible for the employment of safety lamps to be regarded as the prime cause. My object has been to demonstrate the existence of nystagmus in men employing naked lights. It is on this point my views have been assailed, and I have given proofs for my opinion as to its occurrence under the circumstances named. I am not now concerned with the greater or less frequency of nystagmus in pits using safety lamps or naked lights. I have, in allowing imperfect illumination a secondary place, deemed it not unlikely that, other things being equal, the disease would be more frequent under the worst conditions as to light. I am bound to say, however, that the relatively large number I found off work at the naked-light colliery was more than I was prepared for.

We must now pass on to consider in what way the nystagmus of miners is produced. I have no doubt the prime cause of nystagmus must be traced to the peculiar circumstances under which a collier's work is accomplished. As long ago as 1875² I drew attention to this, and stated that "it seems to me this disease occurs chiefly, if not entirely, in those colliers who are obliged to do their work in the pit whilst lying on one of their sides." In a paper before the Ophthalmological Society in 1884 I further elaborated this contention of the relation of position at work in causing the disease. All tended to show that nystagmus was associated with a particular class of colliers performing a particular kind of work. The kind of work alluded to is called "holing." Among other evidence advanced in the paper mentioned was on account of a visit to a coal pit made by me to verify, by actual observation of the men at work, the impressions gleaned from clinical experience. To put it briefly, the men whom one expected to find suffering from nystagmus were so afflicted, whilst others pursuing different kinds of work were unaffected. My further observations will be found to support the views I have previously set forth. Further experience and a better acquaintance with the working of coal mines have shown me that in others besides those "working on their sides" (holing) an attitude is assumed necessitating a somewhat similar position of head and eyes, and cases will be mentioned in which nystagmus has occurred in men so employed.

The workers in a pit are of various kinds. Thus there are laborers (datalers), whose employment is to attend to the roads, to keep them in repair, etc.; trammers or haulage men, who push the tubs or corves, full or empty, along the rails; there are also drivers or pony boys. Now all these men in pits, where protected lights are used, employ safety lamps, and thus work under similar conditions of illumination to others employed underground; yet it is not among these that nystagmus is found. Such is my opinion, and it is amply corroborated by others.

²Lancet, 1875, vol. ii, p. 81.

Dr. Tatham Thompson,³ speaking of the South Wales collieries, mentions the "absence of nystagmus among the laborers and haulers." Mr. Jeaffreson, of Newcastle,⁴ also says "it is equally certain that it is amongst this class (colliers) confined to those that hew coal." Nieden, after examining the large number which he did, found nystagmus confined to the hewers. Dransart is of a similar opinion.

The men employed in a pit who generally receive the name of colliers or miners are those engaged in coal-getting; on their labor all the others engaged depend. At the coal face we shall find men engaged in coal-getting and others employed in filling the corves or tubs with the dislodged coal; these latter are called "fillers" or "loaders;" they are usually paid by the day, and if there are no corves to fill they not uncommonly lend their aid to the coal getters. Nystagmus is exceptionally met with in these "fillers."

The man engaged in winning the coal and the manner in which his work is accomplished possesses the most interest for us. His business is to detach the coal from the coal seam generally by holing underneath the seam. To do this he has to work in a peculiar position. He sits down with his legs crooked up, lying almost on his side, and strikes with his pick at the bottom of the coal, his object being to undermine or undercut the seam. He will clear away the coal thus to a height of 18 inches or 2 feet, and then, as he gets deeper in, he gets his body under the coal, lying on one or other of his sides. The distance he may undercut the coal varies considerably. The process is called "holing," and sometimes he may undermine the seam of coal for 2 or 3 feet to as much as 6 or 7 feet; this is called "bottom holing." There are besides this, however, two other varieties. "Middle holing" is carried on in the middle of a seam, just where shale or friable coal may occur; "top holing," as the name suggests, is done at the top of the seam. In all these varieties the pick is swung to

³Lancet, vol. i, p. 311, 1891.

⁴British Medical Journal, 1887, vol ii, 109

and fro in a horizontal line. The coal is afterward detached by wedges, or in some pits by explosives. Other men may be engaged in what is called "cutting the headings." This work will be done directly forward with the pick swinging in a vertical line; the man will generally be kneeling or crooked down when he does it, but with the head straight; these men are not, I think, liable to nystagmus.

When holing is necessary, about 30 per cent of the work at the coal face is holing, being equivalent to about 20 per cent of the work underground.

I will now advance evidence showing the intimate relation of holing to miners' nystagmus. In 1883 I visited a large well-ventilated pit in which several hundreds of men were engaged underground. I have described this visit in detail in my paper before the Ophthalmological Society in 1884. I was taken to the coal getters. Three sets of these were examined: (*a*) Those who were engaged in "cutting the headings," working with the pick directly forward in the manner already described. In none of these men was nystagmus found. (*b*) Then I was taken to those engaged in holing or undercutting the coal, and four of the six men working at the places I went to suffered from nystagmus. The two who were unaffected were young men. These were the particular class expected to be afflicted. (*c*) Trammers and men otherwise engaged in the pit were examined, and nystagmus was not found among them.

My visit showed me the importance in investigating this question by a personal acquaintance with the interior of a pit. Such a visit goes far to convince one also that the position assumed by the miner must be an important factor in the causation of nystagmus. Dransart is of the opinion that one visit is enough to comprehend the part played by work at the vein.

I have made a calculation that at one time, or another more than 500 cases must have passed under my notice for treatment. I lay particular stress upon this, for my clinical results are based on cases that have sought me—a very different

thing from cases which one has sought for himself. I have made no calculation of, and do not now take into account, a considerable number that I have casually noticed. At the time I commenced this article 14 cases were on my books at the Sheffield General Infirmary. For our purposes now I have collected together all the records preserved of cases. Some are under date several years back, and others, the majority, are recent, within the last year or eighteen months, and they vary much in completeness. The number of which I can get records is 120. All of these have been under treatment except 14, which, as already mentioned, were examined when investigating the workers with naked lights.

Taking now the 120 cases, and analyzing the work performed by them, I find 112 were coal getters and doing "holing" more or less, 3 (there was also a loader included in the naked light series) were "fillers," which should be added to the first group, because, as I shall show, though not regular holers or coal getters, men of this class do work of this kind; two were "deputies," two were "onsetters" at the pit bottom and one was an "engine man," a term which as will be seen presently very imperfectly describes his work. My experience teaches me that the summary as given above would be true also of the cases of which I have preserved no records; besides those mentioned, I do not recollect any other exceptional cases.

Before considering some of these cases in detail it may be well to say a few words on the method to be pursued in investigating the kind of work performed by a miner suffering from nystagmus.

For years it has been my practice to avoid leading questions as to the kind of work pursued and to get the patient himself to demonstrate as much as possible his attitude at his work, the man going down on the floor and illustrating his mode of work; in a doubtful case he has always put himself in the attitude he would assume at his occupation. By adopting this method I have not only gone to the bottom of my cases as far as the kind of work pursued is concerned, but I have ascer-

tained that in other kinds of work in the pit a position of the head and eyes is also assumed, which no doubt acts as prejudicially as does the constrained position in holing. Thus I learnt that a man suffering from nystagmus, who was a "holer," did also work which he called "clodding," that is, clearing the clod or rubbish off the top of the coal. It is a position not unlike "top holing." I had a photograph taken as he represented himself at this work. His height was 5 feet 9 inches, and he worked under 5 feet, and he did so as upright as possible with his head on one side.

The association of nystagmus with the particular kind of workers which my cases have demonstrated has not escaped the notice of others. Dransart, whose painstaking observations in this affection are well known, alludes in a foot-note attached to his paper in the *Annales d' Oculistique*, 1877, vol. ii, p. 121, to the man working in the shallow inclines constantly lying, and adds: "We ought to note this fact that all our workers attacked with nystagmus worked in these inclined bearings."

More recently Ziemiński,⁵ who "has made a special study of nystagmus in England, attributes this muscular anomaly to the constrained attitude of the work of the miners, their look being forced to direct itself obliquely above either to the right or to the left."

In my paper before the Ophthalmological Society I quoted Nieden as assigning the cause of nystagmus to the use of "safety lamps." He kindly wrote pointing out that I had not quite correctly interpreted his views, as he had also found nystagmus in pits where the ordinary lamps were used. He said further: "In all my papers about nystagmus I stated as the *first, prime*, cause of this affection the particular kind of work which the *hewers* had to do in holing the coal in a stretched position of the body, head and eyes."⁶

The pathology of miners' nystagmus is similar, I believe, to

⁵ Analyzed in Rec. d' Opht., 1889, p. 637.

⁶ The italics represent underlined words in the original.

writers', pianists' or telegraphists' cramp. It is a local affection, and is the result of prolonged strain in an unusual and constrained position, chronic fatigue results, and atony of the muscles being induced, oscillation of the globes is caused.

Dransart⁷ held that the disorder was due to the fatigue induced in the elevator muscles in consequence of the cramped position of the miner occasioning strain and a constant upward movement of the eye. I have elsewhere⁸ fully discussed these views.

If we now consider the position of the miner engaged in "holing" we shall, I think, conclude that the position is not sufficiently described "as the constant upward movement of the eyes." There is something more, and whilst Dransart's⁹ explanation accounts for many of the symptoms present, it hardly meets the rotary movements which are seldom absent.

The constrained position of the miner in holing has been already mentioned. It is work common not only in this country, but on the Continent. The French name—*travail à col tordu*—expresses its cramped nature. A man lying on his side engaged in "holing" either whilst making the hole or whilst continuing his work under the coal, will of course fix his gaze at different parts according to where it is necessary to strike, for his eyes will follow his pick point, but the tendency will be for the gaze to be directed more or less obliquely. I have satisfied myself on this point times without number. The miner will lie on his side, sometimes the left, sometimes the right, as is most convenient; his legs will be crooked up, his head thrown back and flexed more or less on the shoulder beneath, and the eyes will have the direction as just mentioned.

The physiology of the ocular movements supports my contention, because when we incline the head to one side or the

⁷Annales d' Oculistique, 1887, vol. ii, p. 128; 1882, vol. ii, p. 150.

⁸Ophth. Soc. Trans., 1884.

⁹In a recent paper before the French Ophthalmological Congress (Rec. d' Opht., May, 1891) Dransart speaks of "the uperward and oblique gaze" of the miner. Out of 179 cases of nystagmus he says 92 used safety lamps and 87 naked lights.

other by turning it on its antero-posterior axis,¹⁰ rotation of the two eyes upon their antero-posterior axis takes place probably by the instrumentality of the oblique muscles.

A miner working on his left side will be using in the left eye the superior rectus, inferior oblique, and internal rectus; and in the right the same two first named muscles, but substituting the external for the internal rectus. If he be on the opposite side the arrangement will be reversed. The to-and-fro movements met with in nystagmus are thus accounted for by the weariness of the outer and inner recti, the rotatory by the inferior oblique, and the superior rectus aids here or in occasioning the vertical movements.

Before leaving this portion of my subject, I may mention as worthy of note the ready manner in which discomfort is occasioned and nystagmus rendered evident, even in cases that have improved by rest or change of work, by assuming before one the position required in holing. Also the oscillations become perceptible on directing the eyes upward¹¹ and particularly obliquely upward, when otherwise they would be less evident or pass unnoticed. Some men are accustomed to do their work with one side down more than the other, and not infrequently the oscillations are more marked on looking to one side, and it is often possible thus to tell the patient on which side he is most accustomed to work. I find 10 such cases in my record, but the condition was not always looked for.

Among the 115 cases that I have classified under the name of doing holing are included three "fillers." These at first sight might appear as exceptions. Nystagmus is infrequently met with in fillers, and these are the only instances I recollect at any time coming under my observation. A filler's work is to fill the corves or tubs with coal. He, however, aspires to be a collier, and is not unwilling to lend a hand at coal getting—in fact, when he has no tubs to fill he is expected to do so.

¹⁰Carpenter's Physiology, p. 896.

¹¹The motions cease on looking downward.

One of these cases in particular I very carefully inquired into, and went some distance, in company with Mr. Wightman, assistant house surgeon at the Infirmary, to interview the men with whom the young man worked, and learnt that he never passed a day without holing. As to the others I also satisfied myself.

For many years I have been on the look-out for exceptional cases. I have asked my friends in colliery districts to send me any they might observe. The five to be mentioned now are the only ones I have notes of or recollect. Of these, two were "deputies." Until quite recently I had not seen cases from this class of pitmen; it is, however, easy enough to understand why they should suffer. I found both instances when examining cases from a naked-light pit. The duty of a deputy is to enter the pit and examine the workings for the presence of gas before the men go to their work. He has also to ascertain carefully the condition of the roof. They are selected for this post for their steadiness and intelligence. I will give particulars briefly of one of these cases:

C. W., æt. 32, has worked in a pit twenty-two years. He has worked at coal-getting and holing, but for the last eight years he has been a "deputy." He previously used candles, but, though still working in a candle-lighted pit, it is necessary for him to employ a "safety lamp" for detecting gas, etc. He works a nine hours' hift; that is, he is in the pit at work for eight hours. For about four continuous hours he is in the working places from 4 to 6 feet examining the roof. On finding out that he was suffering from nystagmus and learning he was a deputy, I at once asked him to put himself in the position for examining the roof. He placed himself with head on one side, and the eyes directed upwards and obliquely, as expected. There were several colliers in the room, and they agreed as to the correctness of the position he assumed. I have since had his photograph taken, and obtained the agreement of a fellow deputy and several of his fellow workmen to the correctness of the picture. He is a man of about 5 feet 7 inches in height, and in the photograph he is represented in

the position assumed by him for examining the roof under 5 feet. It must be recollected that in the pit his head must be on one side, and if he raises it he will strike it against the roof. His symptoms date back to about twelve months, and for five weeks in the autumn he was off work. The oscillations were well marked. He finds stooping and looking up makes his eyes bad, and he tries to keep them directed downwards as much as possible.

The second patient had also used naked lights until he became a deputy; he has had symptoms for two years.

Both these men, it will be noticed, had previously been engaged in "coal-getting and holing" and using naked lights. There is no evidence of their having suffered during this period from nystagmus, and I accept the cases as developing the malady during the time they have been deputies, and I think the explanation I have given of muscular strain is the correct one.

The next case is also one of considerable interest. He was a man, æt. 28, when he came to me in December, 1882. He had had symptoms of nystagmus for two years, but particularly for the last three months. He was an engineman at the bottom of the pit. My notes made at the time were sufficiently complete, but the characteristics of the case were unusual, and I determined to try to find him again. I did so, and he came to me quite recently. The facts are briefly these: The name given to his employment is misleading, and although the place where the engine was situated is lofty (20 feet), he had a lot of work to do attending to pipes under 5 feet and less—his own height was about 5 feet 10 inches. He had to lie on his side attending to the pipes, and his work necessitated much turning of his head on one side, very similar, as he said, to that assumed by a man "holing." He worked with paraffin lamps, but when it was necessary to go to the donkey engine, which was some distance away, he used a safety lamp. Acting on my advice (given in 1882), he had ceased to do this kind of work, and obtained employment on the pit bank. He still, however, has to go into the pit frequently, and still uses a

"safety lamp." He travels with it 1,000 yards down an incline, and 500 more to the workings (donkey engine). He does no work now necessitating such a position as was formerly the case, and, though he still uses a safety lamp a good deal, he is perfectly well, and has been so for several years. There are no oscillations of the eyeballs discoverable by any means, nor has he had any symptoms since shortly after changing his work.

The remaining two cases are of peculiar interest, and I must direct special attention to them because they worked in a good light, and the question of safety lamps or imperfect illumination has therefore no place. They are both occupied at the bottom of the shaft; they have been previously mentioned, but it will be necessary now to go a little more into detail.

The light at the bottom of the pit shaft will be recognised to be good. As before mentioned, in some pits it is lighted by the electric light or gas, and in others by large paraffin or oil lamps.

One of these patients was a man, J. H., who came to me in October, 1890. He had suffered from the lights dancing for about three or four months; nystagmus was present, but not very markedly. He worked at the bottom of the shaft as an "onsetter." There is, he says, "plenty of good light from oil lamps." He has never worked at the coal face or as a practical miner.

I find he is "head hanger on," his work being to ring off, that is, when the tubs are full he signals to the top, and whilst these go up the cage comes down with the empty tubs. He stands at his work, and has to look up to the cage ascending and coming down, his head and eyes being frequently turned in an obliquely upward direction, with his head on one side. Other men shove the tubs on to the cage. The facts here given as to this man's work were supported by three other patients from the same pit, who constantly saw him at his post. Besides this, as the patient came up to one, he did so with his head on one side.

The other, T. M., was a man, æt. 28. He has nothing to do with coal getting. He says "There is plenty of light from big paraffin lamps." I need not further detail his case.

Now in these two cases the "light" question does not come in. There are many occupations above ground pursued in no better or even in worse light. I think the explanation of the causation of nystagmus given is correct. Viewing the five exceptional cases together, it is clear that there are instances of men working underground who suffer from nystagmus, and though not working at coal getting, are pursuing their avocations in a manner that is not irreconcilable with the views I have set forth as to the prime cause at work in occasioning the disorder.

I must pass by many interesting points connected with treatment, and allude only to some of the results, which lend valuable aid in support of the contention as to the part played by the miner's manner of work in causing his malady.

Formerly it was my practice, after a period of rest in severe cases, or more quickly in slighter ones, to advise the patient to seek some work outside of the pit, on the bank, or to obtain some other employment. Increased experience has taught me that leaving the pit, except temporarily, is unnecessary. I lay particular stress upon this.

Included among the 120 cases with which I have dealt in this article—or really 106, because 14 were not actual patients, but were included in a special inquiry as to naked lights—will be found several instances which will bear out the statement that a change of work has been followed by improvement, and they have been enabled to continue working underground. All that has been necessary is that any occupation causing such a constrained position as holing should be discontinued; safety lamps have been used as before.

The following is a particularly interesting case. W. B., æt. 29, came to me at the Infirmary on November 11, 1890. He has worked in the pit for twenty years, and has used safety lamps for fourteen years. He has been suffering from symptoms for about the last two or three months. Quite recently

he became worse, and was compelled to leave his work, and, thereupon, came to me. He was similarly afflicted five years ago, and was under my care then, and recovered. On my advice he obtained work outside the pit. He continued at this for twelve months, then he went into the pit, looking after the roads and ponies. Then for six months he did getting coal down after it had been holed by others, and removing the "spraggs" or wood supports. He did all this work with safety lamps, be it remembered, without finding it, as he says, trying to his eyes. He thought he might return to his old occupation of holing. He did so, and at the end of four months he was compelled to leave his work, and again seek my aid, and this notwithstanding a respite of getting on for five years since he had done holing before. He was a bad specimen of nystagmus. By treatment, at first at my hands and then at the medical side of the Infirmary under my friend, Dr. Cocking (for he had also cardiac disease) he has again made a most satisfactory recovery. He will soon be fit, if he wishes it, to obtain employment underground again, but he will not do holing. When the man first came to me five years ago he was a "lamp man." Is it to be wondered at that he is now convinced that to the constrained position necessitated in holing is to be attributed his disorder?

It is unnecessary to give details of other cases. One of the most recent is a man I saw at Christmas last, of whom my friend, Dr. Scott, writes: "S. has changed his work to 'dataloging;' he lays rails down for trams, and although he is working in quite as bad a light—ordinary lamps (safety)—still his eyes are not so bad."

In conclusion, let me say that it has been impossible in the space at my command to have either dealt fully with the points mentioned, or indeed to bring out all the evidence and facts, which in the course of a long investigation have accumulated in my hands. Many important facts have been omitted; so much, indeed, is this the case, that it is my purpose shortly to publish in book form my observations in a complete manner, and to illustrate by engravings and photographs the vari-

ous kinds of work pursued in the pit. For the present, I think I have brought forward sufficient evidence to show that not only is nystagmus met with in the workers with naked lights, and that by no means infrequently, but, further than this, instances have been given of its occurrence in men, not practical miners, pursuing their work in a good light; that it is impossible to regard, therefore, the use of safety lamps as a sole, or even essential, element in causation, and that even imperfect illumination may be absent. On the other hand, the evidence given as to the men seen at work in the pit, the analysis and consideration of the cases, supported as it is by the views of Dransart, Nieden and Zieminski, point to the position assumed at work as the prime element in causation. It has been further shown how such a theory is consistent with the symptoms present, and that the results of treatment so based are eminently satisfactory.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

NYSTAGMUS IN A COMPOSITOR.

Mr. Snell (Sheffield) brought forward this case. The patient, æt. 21, had just completed his apprenticeship, and was engaged on the staff of a large daily paper. He came under observation on October 17, 1890. His work for some months had been heavier than usual, the hours from 7 P.M. to 3 A.M. Two days before coming to Mr. Snell he returned home from work, went to bed, and rose as usual at 12 (noon). Then he noticed objects moving up and down, with some giddiness; no pain in head, nor sickness. The nystagmus was found to be vertical, and the movements were rather jumping; there was quivering of eyelids. He was carefully examined for any central or other lesion, with negative results. The absence of any assignable cause and the resemblance in some particulars to miners' nystagmus suggested inquiry as to the way his work was performed. He was visited at the printing office, which was of course well lighted, and it was found that when he

looked up to his "copy," instead of raising head and eyes together, he elevated the eyes only. This was fully described. Anyone trying it would find out how tiring it was. Other men at work raised the head with the eyes. The patient gradually recovered, oscillations disappeared, and he returned to work on December 30. He now worked with comfort, having adopted the suggestion as to raising his head at the same time that he looked up from the type to the "copy." Quite recently he had developed "compositor's cramp" in the right hand, and was incapacitated thereby from doing his work. Mr. Snell alluded to his views as to miners' nystagmus having for its prime cause the constrained position in which coal getters worked. He mentioned instances occurring in men (not practical colliers) working at the pit bottom in good light, whose gaze was constantly turned up as the cage ascended and descended. Nystagmus, Mr. Snell thought, would probably be found associated with other occupations occasionally. Writers' cramp had been followed by the recognition of many similar conditions. The mention of this compositor's case would perhaps lead others to recognize more the connection of nystagmus with occupation.—*Brit. Med. Jour.*

A BLACK SPOT AT THE MACULA LUTEA IN
A CASE OF EMBOLISM OF THE ARTERIA
CENTRALIS RETINÆ.

BY DR. T. INOUE, TOKYO, JAPAN.

Miyabé, a girl, æt. 7, consulted me October 19, 1890, with the following history:

Three years previously she had suffered from blenorrhœa which had caused blindness in the left eye. At the same time she became emaciated, and exhibited a morbid appetite, devouring greedily mud, linen, etc.

October 17, on rising in the morning she found that she was completely blind, the right eye also having become affected. The patient felt well in other respects, and there was no heart lesion. In the right eye all perception of light was lost, but the exterior of the eye appeared normal. With the ophthalmoscope it was at once noticed that the usual transparency of the retina was wanting. In consequence of this the pale optic disc was not sharply outlined. The arteries and veins were not clearly distinguishable, and it was difficult or almost impossible to say which were the arteries and which the veins. All the veins were narrow and thread-like, showing in the middle a barely perceptible light-reflex. The arterial current was interrupted and slow. Between the separate blood-cylinders the vessel tube appeared as a bright thread-like line. At the macula lutea a small coal-black spot was seen in place of the usual cherry-red one, so well known in embolism.

This color interested me, since in the Japanese I had never before found the spot black, but always red. The Japanese are strongly pigmented, and it is probable that the black choroid shone through the thin fovea centralis, although the child was not unusually dark.

I have found no case similar to this in literature, and I am curious to know whether in cases of embolism in the negro the macula lutea appears black or has its usual cherry color.
—*Sei-I-Kwai Medical Journal*.